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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/898,259	07/03/2001	Eiji Nakashio	09792909-5083	1899

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EXAMINER

BEACHAM, CHRISTOPHER R

ART UNIT PAPER NUMBER

2653

DATE MAILED: 02/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/898,259

Applicant(s)

NAKASHIO ET AL.

Examiner

Christopher R. Beacham

Art Unit

2653

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claim 4 is objected to because of the following informalities: Claim 4 is not complete. Examiner will assume for examination purposes that claim 4 has the same limitations as claim 9. Appropriate correction is required.
3. Claims 5 and 10 recites the limitation "The apparatus according to claim 1" in the first sentence. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 5-7 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Gill (US 6,256,178).
6. Regarding claims 1, 2, 6 and 7, Dill shows a magnetic tunnel effect type magnetic head comprising:

a first soft magnetic conductive layer 80, which is to provide a lower shielding, layer;

a metal oxide layer 235 and a first nonmagnetic conductive layer, formed on the first soft magnetic conductive layer, to provide a lower gap layer.

a magnetic tunnel junction layer 230 formed on the first nonmagnetic conductive layer to provide a magnetic tunnel junction effect;

a second nonmagnetic conductive layer 225 formed on the magnetic tunnel junction layer 230 to provide an upper gap layer; and

a second soft magnetic conductive layer 82 formed on the second nonmagnetic conductive layer 225 to provide an upper shielding layer;

the spacer layer 235 of the lower gap layer is disposed beneath at least the magnetic tunnel junction layer (see Figure 14).

Gill teaches that a metal oxide layer 235 that may be made from aluminum oxide, aluminum nitride or silicone dioxide and is sandwiched between the first and second shield layers (col. 8, lines 26-28). Additionally, Gill discloses a non-conductive insulation layer being located between the antiferromagnetic pinning layer and the first shield layer in the track width (col. 9, lines 28-30).

7. Regarding claims 5 and 10, Gill shows the apparatus being of a yoke type in which the magnetic tunnel junction element is not exposed from a medium-opposite face (see Figure 10).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3, 4, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gill (US 6,256,178) as applied to claims 1 and 6 above.

10. Regarding claims 3, 4, 8 and 9, Gill does not set forth the dimensions in these claims. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the metal oxide layer of Gill with the claimed dimensions through routine experimentation and optimization in the absence of criticality.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Nakatani et al. (US 5,390,061) is cited to show a multiplayer magnetoresistance effect-type magnetic head.
- Tsuge (US 6,392,381 B1) is cited to show a ferromagnetic tunnel junction device and method of forming the same.

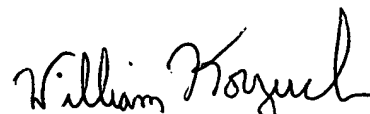
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Beacham whose telephone number is (703) 605-4256. The examiner can normally be reached on M-F, 8: 00 am-5: 30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (703) 305-6137. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.



Christopher R. Beacham
Patent Examiner
Art Unit 2653
February 10, 2003



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